Aid effectiveness for poverty reduction: lessons from cross-country analyses, with a special focus on vulnerable countries

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1. Introduction: focus of the paper

Following the adoption of the MDG, particularly the first one that is to reduce poverty by half between 1995 and 2015, numerous studies have examined how external aid can contribute to their achievement. The formula "doubling aid to reduce the poverty by half" relied on the implicit assumption that aid was an effective instrument for poverty reduction. The formula and corresponding assumption have been debated. Two opposite views clearly appeared, one, represented by Jeffrey Sachs in his End of Poverty, underlining the need for a big push to get low income countries out of poverty traps, the other one, illustrated by the attacks of William Easterly against aid as a support of a big push and the idea of a poverty trap, and also including arguments about a limited absorptive capacity. Elsewhere we have argued that the absorptive capacity of aid depends on aid modalities and can be enhanced by a reform of aid, a way by which big push and absorptive capacity views can be reconciled and to which we come back later (Guillaumont and Guillaumont Jeanneney, 2010). .../...

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…/… Actually the academic debate on aid effectiveness of the first millennium decade has been dominated by another controversy, relying on cross country regressions and initiated by the highly influential paper of Burnside and Dollar (2000). After so many cross country studies following their paper, supporting or, more often, criticizing it, there seems to be a temptation to consider this research orientation as a deadlock and to switch to micro impact analysis. Whatever the importance and need of impact micro-analyses, we argue that it would be a dangerous dismissal to give up the cross-section approach, for several reasons. First the methodological weaknesses of many studies does not entail that other ones relying on better methodology and data cannot lead to more robust results. Second, since cross section studies on aid effectiveness will never be totally given up, there is a risk to see only the most provocative (and possibly least robust) retaining the attention of media and policy makers, a policy challenge to be kept in mind in the orientation of research. Finally micro studies and impact analyses, while they supply policy makers with useful information in a given context, are not an appropriate tool for assessing the impact of macro-economic features of countries on aid effectiveness.

The aim of this paper, relying on results of the cross country literature on aid effectiveness, and drawing only on those we consider as particularly relevant and robust is to examine how aid can contribute to poverty reduction, with a special focus on the way it can address the vulnerability of many developing countries.

There are several important challenges faced by the macroeconomic and cross-sectional studies of the contribution of aid to poverty reduction and examined in the paper. First, country regressions used to test the effect of aid on any variable have been highly criticized for their inability to take the heterogeneity of the country situations into account (Bourguignon and Leipziger, 2007). But an appropriate specification of the models used, including conditional and non-linear effects, may address this issue to some extent. Second the quality of statistics, as well as the relevance of the aid concept, is often also criticized, and it is clearly for improvements. Third, as we shall see, the most critical issue is the treatment of a possible aid endogeneity.

Most cross- country econometric studies of aid effectiveness have been focused on economic growth. Indeed growth of income per capita is, on a cross-sectional basis, the most easily available and measurable summary indicator of economic outcomes. Consequently, the effects of aid on poverty reduction have been mainly investigated through the effect of aid on economic growth, with respect to a (supposed) given income elasticity of poverty (e.g. Collier and Dollar, 2001, 2002). Besides its effect on poverty through the rate of growth, aid may have either a direct impact on poverty for a given level of income growth (Alvi and Senbeta, 2011) or an impact on the income elasticity of poverty.

Almost never has the impact of aid on the poverty level been measured by traditional indices of monetary income poverty such as the headcount index or the poverty gap been directly

examined[1]. Is the difficulty in gathering comparable estimates of poverty change enough to explain this strange missing? Some studies have considered the effect of aid on the change in the level of another summary indicator of development or of welfare, such as the Human Development Index (Boone 1995; Kosack, 2003; Gomanee et al., 2005a, 2005b), identifying aid effectiveness as its ability to improve the overall quality of life. Some authors have also looked for the impact of aid on the level of a specific indicator of human development, for instance infant mortality (Gomanee et al., 2005; Mosley and Suleiman 2007) or child mortality/survival (Burnside and Dollar 1998) or the school enrolment ratio (Michaelowa and Weber 2007, Dreher et al. 2008, d'Aiglepierre and Wagner 2013).

To overview of the contribution of aid to poverty reduction according to cross-sectional studies we need to examine the main various channels by which aid can influence the level of poverty. Three main macroeconomic channels of aid effectiveness for poverty reduction, each with its own lags, can be distinguished.

The first, traditional channel is from aid to growth and from growth to poverty reduction. Both relationships have been debated, the first identified with "aid effectiveness", the second, related to the income elasticity of poverty and recently raised. This channel is examined in section 2.

The second channel is from aid to the volume and composition of social public expenditures, particularly on education and health, and from these expenditures to corresponding poverty indicators. This impact of aid may result from its total amount or from its allocation to social expenditures, although it meets a problem of fungibility. Moreover the various kinds of public expenditures likely to be influenced by aid have different effects on poverty reduction. Thus, there is a need to disentangle lessons from the literature on how aid can influence the level of poverty through the structure of public spending. Special attention should be paid to the kinds of conditionality attached to aid given in the form of budget support. These issues are examined in section 3.

Last but not least a third channel, less explored in the literature, is linked to the macroeconomic stabilizing effect of aid, working mainly at the macroeconomic level, thus better captured by cross country studies, as we suggested in several previous works. We argue that, to a large extent, the effect of aid on economic growth, and the contribution of growth to poverty reduction, are linked to their stabilizing impacts. By making growth less volatile, aid both accelerates growth and makes it more pro-poor. We also suggest, but relying on more limited findings, that this double stabilizing effect on poverty may be supplemented by a third one, as public expenditures are influenced by macroeconomic instability. Results related to this third channel are examined in section 4.

[1] Exceptions are found in Mosley and Suleiman, 2007, who consider the impact of aid on a rather limited and heterogeneous sample of 39 countries using annual data, and in Alvi and Senbeta (2011).

1. The growth-poverty channel

For several decades, there was conflicting evidence in the macroeconomic literature on aid effectiveness, which was essentially related to growth, savings and investment (for a survey on the "old" and "new" literature see Guillaumont 1985, Guillaumont and Guillaumont Jeanneney 2006, Amprou and Chauvet 2007, Tarp 2006, Thorbecke 2000, …). As for the growth channels through which aid can reduce poverty two relationships are to be considered: what is the impact of aid on growth? What is the impact of growth on poverty? The answer to the first question has appeared to a large extent to depend on some specific features of recipient countries, and some aid characteristics as well. The answer to the second one depends on the income elasticity of poverty, a parameter generally not examined in relation to aid inflows.

1.1. The aid-growth relationship: main methodological challenges

Ideology versus methodology

It is remarkable how it has been difficult to make clear from the data that developing countries benefit from aid. Although methods have evolved and data sets quality has improved, conclusions drawn from a large number of studies have seemed to remain mitigated. Individual experiences from the ground did not provide much comfort to researchers and policy makers either. Great successes in terms of health or educational improvements were often blackened by dramatic country failures, corruption evidences or simply a lack of ownership. Those various contradictions fuelled the debate and gave birth to strong antagonisms among the civil and academic society alike, making the message even more difficult to understand for taxpayers and political leaders. The last illustration of this controversy can be tracked back to 2009 and the publication of *Dead Aid* by Dambisa Moyo (2009). By its widespread diffusion and using seemingly convincing microeconomic examples, Moyo's book attracted much attention in the aid effectiveness debate at the macroeconomic level. It also illustrates how radical the positions on this issue may be. The idea that aid has done more bad than good in particular in Sub Saharan Africa today echoes with earlier contributions notably by William Easterly (2006) and quite earlier ones coming from the two opposite wings of the ideological spectrum, such as Milton Friedman and Keith Griffin.

Already in 1987, Paul Mosley (1987) argued that while aid seems to be effective at the microeconomic level, its aggregate impact, notably on growth and income per capita, was very difficult to identify from the data, an insight known as the "micro-macro paradox" and noted again in numerous empirical studies. At the microeconomic level, conclusions are mostly straightforward: well-designed aid financed project have the potential to generate positive and observable results. Those findings are now considered as highly robust thanks to the development of impact evaluation techniques. Therefore, the core of the controversy lies at the macroeconomic level, where evidences are still much more mixed. A strong illustration is here given by the recent and contradictory contributions of Rajan and Subramanian (2011) and Arndt, Jones and Tarp (2010). Doucouliagos and Paldam (2009) reviewing results in a meta-analysis of 97 empirical studies also

argued that most of the evidence points to the fact that aid has not been effective. According to them, if there was a positive effect of aid on growth it would be small and of economic little significance. But the conclusions they drew from meta-analysis were themselves strongly criticized by Mekasha and Tarp (2011). Using alternative technics and a slightly different sample, they show that the effect of aid on growth is positive and significant. Indeed, the relevance of meta-analysis for giving the state of knowledge on the aid the aid-growth relationship may be questioned, as far as it averages conclusions of studies with various theoretical assumptions, time horizons, and econometric robustness.

Actually, referring to numerous macroeconomic cross-section studies, two major categories of critics were formulated. First the theoretical background of empirical studies was strongly questioned. From simple models of the growth process as the the Harrod-Domar where aid impacts growth through capital accumulation to the two-gap Chenery-Strout models where aid aid also impacts growth by supplying foreign exchange, and technical capacity as well, then to those focused on the impact on relative prices (Dutch disease effects) or on incentives and governance, the foundation of the empirical works kept evolving, contributing to suspicion toward their related empirical findings. Second, as the quest for solid results turned out to be elusive, more sophisticated econometric methods came to the rescue. Limited by data availability, the first studies relied on rough cross-section ordinary least squares analysis. Then, with time, larger datasets were constructed allowing the use of more precise estimators. During the last decade the debate about the cross-section approach to aid effectiveness has been focused on five main methodological issues. We briefly review below how they have been addressed.

The aid definition and composition issue

The first curse comes directly from the official definition of what is considered as development aid. Most studies use the OECD-DAC website definition: "Official Development Assistance is defined as those flows to countries and territories on the DAC List of ODA recipients and to multilateral development institutions which are: 1) provided by official agencies, including state and local governments, or by their executive agencies; and 2) each transaction of which: a) is administered with the promotion of the economic development and welfare of developing countries as its main objective; and b) is concessional in character and conveys a grant element of at least 25 per cent (calculated at a rate of discount of 10 per cent)."

It results that, as an aggregate, ODA is very broad and covers a lot of heterogenous transactions. According to this definition, ODA include inter alia financial flows representing debt relief, budget support, technical assistance, project investment, capacity building, and emergency aid, etc. Particularly debated are the flows considered to be ODA, but not corresponding to a transfer to "recipient countries", such as the cost of foreign students for host countries. Also debated is debt relief which may represent a high share of ODA, while a large part of debt would have not been repaid. Moreover each flow comes in the form of grants or loans, themselves supplied with various conditions.

In order to address the issue of the heterogeneity in financial conditions, , some attempts were made in the early 2000s to improve the definition to be used in empirical research as with the Effective Development Assistance (EDA) set up by Chang et al. (1998) and used by Burnside & Dollar (2000) and Collier and Dehn (2001). EDA excludes technical assistance and counts disbursements of concessional loans at full face value, using a country and time specific discount rate rather than the 10 per cent discount rate of the OECD – Development Assistance Committee (DAC). However the consequences of these financial conditions are likely to be effective in various time horizons.

As for the notion of programmable aid, introduced by the OECD in 2007, it has so far failed to renew econometric studies due to a lack of temporal depth of the available series. Indeed, the series of programmable aid are available only from 2000 for total ODA and from 2004 for sector specific aid flows.

Since most studies were examining the impact of total aid inflows, other kinds of aid heterogeneity were to be addressed. For instance, Kimura et al. (2010) examines whether aid proliferation hinders economic growth. The presence of large numbers of donors and projects overwhelms the recipient government's capacity to manage and administer aid inflows because of higher transaction costs in recipient-donor coordination. Kodama (2012) argues that the unpredictability of aid reflected by the discrepancy between commitments and disbursements is also an issue. Hence, donors could make aid much more efficient by meeting their commitments. Some other discussions link the effectiveness with the multilateral or bilateral origin, supposing different motives of aid, with various results. Multilateral aid is often supposed to be more concerned by poverty mitigation than bilateral aid, supposed more driven by strategic motivations: disaggregating aid by source, Alvi and Senbeta (2011) find evidence that aid from multilateral sources does better in poverty reduction compared to aid from bilateral sources. But Ram (2003) finds opposite results in terms of economic growth.

ODA is obviously a very mixed bag of heterogeneous components which may or may not impact growth with the same magnitude nor in the same time schedule. Investments in health or education facilities, for example, will only spur growth over a longer term. An important issue is related to the possible need of disaggregating aid flows and considering their impact on various time horizons (as done by Clemens et al 2012, and Reddy and Minoiu 2010).

Finally, many researchers have been forced to abandon the use of total aid to estimate rather the impact of sector specific aid on less general indicators (see below). However, the development of new databases of better quality relying on more relevant concepts could be the starting point for a renewed interest in the study of the relationship between aid and growth. This type of adjustments of aid data for the purpose of cross-sectional studies appears to have been abandoned in recent years. Yet can the recent OECD initiative to launch a discussion to a new definition of aid can be used to distinguish two distinct definitions, the first one focusing on the budgetary costs for

donors , the second one corresponding to the net flows of concessional resources made available to the recipient countries in a given period.

The aid endogeneity issue

Another and major econometric curse of the aid-growth empirics is that behind the real causal relationship there is an artificial and obviously non causal relationship. Aid may or may not influence growth, but it is probably targeted toward countries with the lowest growth rates. Hence, slow growing countries displaying the lowest performance may be the ones receiving the largest amount of aid. From this, it simply results that the correlation between aid and growth is negative and significant and that empirical works have to convincingly tackle this simultaneity issue to produce strong valuable evidence (Brückner, 2013)[2].

Even when they seem sound, methods to deal with endogeneity, i.e. instrumental variables or GMM, rely on various debated hypotheses and a consensus is yet to be found on this issue. In an influential paper, Deaton (2010) showed that most of the instrumental variables used so far, notably by Burnside and Dollar (2000), tend to be external but not exogenous to the growth process. Taking the example of the population size which was one of the traditional instruments at the beginning of the 2000s (see Roodman, 2007 and Clemens et al., 2012, for a review), he rightly argues that population size does impact growth through numerous channel and not only through the amount of aid allocated to recipients countries, hence violating the condition of exogeneity. Moreover those studies, using specific country dummies as for example Egypt and CFA Franc zone dummies which were also popular instruments, provide distorted estimates of the real aid-growth relationship. Furthermore, dynamic panel GMM methods meet themselves some limitations: instruments proliferation or weaknesses are critical issues when using such estimations methods. Finally, some doubt was shed on critical validity conditions of these estimators that, in the case of the growth process, are very difficult to meet (Bazzi and Clemens, 2010).

Researchers have become aware of the potential bias introduced by a weak instrumentation strategy, and methodologies have evolved accordingly. For example, Tavares (2003) proposed using the variation of aid flows allocated by the largest donors for geostrategic reasons, such as distance in kilometres as well as colonial, linguistic and religious ties, as instrument. In that case, variations of aid flows only reflect modification of the fiscal position of donors and are uncorrelated with outcomes in recipient countries. Based on the same logic, a variant of this method is also proposed by Guillaumont and Laajaj (2006). Another attempt to improve this method consisted in adding a geopolitical instrument, reflecting the alignment of votes of recipient countries to donors when they are non-permanent members of the Security Council of the United Nations (see, for example, Collier and Hoeffler, 2007). But, according Dreher et al. (2013), additional aid allocated for

[2] Nevertheless, faced with the difficulty of finding instruments both strong, exogenous and external to the growth process, some authors as Clemens et al. (2012) and Dreher et al. (2013) argue that today, a non-instrumented estimation is the best option if the instruments used are not robust enough. They then recommend the use of the first difference lagged by one period of the aid variable.

political reasons seems less effective than total aid, so that the use of this instrument can bias negatively the estimation of the effect of aid on growth.

Presenting itself as an alternative to Tavares (2003), the method of Rajan and Subramanian (2008) and its improved version by Arndt, Jones and Tarp (2010) consist in estimating a "gravity model" of aid allocation in order to produce an instrument representing the share of aggregated aid flows predicted by purely exogenous components such as distance and colonial links. However, the population size of recipient countries, included as an explanatory variable of the gravity model, has a very strong weight[3] in the final instrument (Bazzi and Clemens, 2010 and Clemens et al., 2012). As we have seen above, the use of the population as an instrument has been heavily criticized, thereby casting doubt on the instrumentation and the results proposed by Rajan and Subramanian (2008).

These instrumentation strategies remain intensely debated. Again, in a recent contribution, Bruckner (2013) shows that the relationship between aid and growth is positive when using an adequate treatment of the endogeneity of aid, namely a two-step procedure closely related to the approach taken in the empirical macro literature to identify the causal effects of fiscal policy: he shows that a 1% increase in foreign aid increased real per capita GDP growth by around 0.1 percentage point. In the first step, he estimates the response of foreign aid to economic growth, using rainfall and international commodity price shocks as IVs to generate exogenous variation in real per capita GDP growth for a panel of 47 least developed countries (LDCs) during the period 1960–2000. In the second step, after the causal response of foreign aid to real per capita GDP growth is quantified by the IVs estimates, he uses the residual variation in foreign aid that is not driven by GDP per capita growth as an instrument to estimate by two-stage least squares the effect that foreign aid has on per capita GDP growth.

The heterogeneity issue: countries characteristics conditioning aid effectiveness

The third and also a major issue raised by the macro-economic assessment of aid impact has been identified for a long time from microeconomic studies. What is working in some place and at some point of time may not produce the same outcome if conducted somewhere else or later. If microeconomic responses to aid are heterogeneous, it is likely that the same applies at the macro level. This point has been at the centre of the empirical research for almost twenty years. Many hypotheses have been tested, debated and criticized. One thing remains certain: aid effectiveness is conditional to various factors that have to be taken into account, if one tries to identify the effect of aid on growth.

In the late 1990 was a water shed in the literature of aid effectiveness, from the circulation and publication of the paper by Burnside and Dollar (1997, 2000), and the debate which followed. Compared to the previous cross-country literature, the new one was led to consider that the effects

[3] According to Bazzi and Clemens (2010), when considering the sample used by Rajan and Subramanian, the correlation between their instrument and the logarithm of the size of the population is above 90%.

of aid are heterogeneous, since they can depend on some characteristics of the recipient countries and, as we see later, on the level of aid they receive. These "non linearities" in the aid- growth relationship were captured in the first case by adding to the aid explanatory variable a multiplicative variable (aid x the indicator of the feature supposed in conditioning its effectiveness).

The most innovative aspect of the Burnside-Dollar paper was to assess aid effectiveness by a way where it depends on specific features of the recipient countries. Its most debatable aspect was to consider the country policy as the only such feature. Burnside and Dollar (1997, 2000) made effectiveness depending on an indicator of macroeconomic policy, an average of indicators of openness (the Sachs and Warner index), of fiscal balance and of monetary stability. For the consistency of their analysis, they also assumed that aid had no effect on policy, involving the inefficiency of conditionality. Their thesis was disseminated through the World Bank book *Assessing Aid*, where the same policy indicator was used. In the next step, Collier and Dollar (2001, 2002), aimed at designing an optimal aid allocation among countries in order to minimize the number of the poor in the world (see below). They used another concept and measurement of policy, the "Country Policy and Institutional Assessment" (CPIA) index, reflecting Bank staff opinions on the recipient countries[4] and used for the allocation of IDA funds[5]. These papers have been very influential on bilateral as well as multilateral aid policies (see Dollar and Levin, 2004, for instance), an influence reflecting a political choice ("to help the good guys"), rather than a real consensus on the factors determining aid effectiveness.

Indeed the model of an aid effectiveness depending essentially on policy has been extensively debated. Several kinds of criticism have been presented. First, the analysis was based on the assumption that aid does not influence economic policies and institutions of the receiving country. Relying noticeably on case studies launched by the World Bank (Devarajan et al. 2002), the research to support this thesis has instead reached more nuanced and often opposite conclusions. Second, measurement of the quality of policies and institutions seemed too narrow in the first papers of Burnside and Dollar and then too subjective through the CPIA, with circular reasoning (policies are likely to be considered as good when results are fine, particularly when aid is successful). There was also some discussion of the time and space dimensions of the econometric estimations. Referring to six four year periods (over 1970-93), while increasing the number of observations, only allowed the authors to capture short or medium term effects (Clemens et al. 2012). A major debate was related to the country sample of Burnside and Dollar, criticized in particular by Dalgaard and Hansen (2001), who discussed the elimination of outliers. Easterly et al. (2004) extended both the period and the sample covered, then using exactly the methodology of Burnside and Dollar, they no longer found their results.[6] Moreover studies considering all kinds of developing countries,

[4] The CPIA is a composite index from sixteen components covering four areas (related respectively to economic management, structural policies, policies for social inclusion and governance).
[5] The model they used to estimate the relationship using growth included aid squared (with a negative coefficient) implying that the diminishing marginal returns to aid lead to an optimal allocation (see below).
[6] Burnside and Dollar (2004) responded, arguing that expanding the sample explains the change in the results.

including a number where aid is negligible, may lead to biased estimates when the effect of aid is supposed to be conditional on another variable.

Finally, specification of the model and the robustness of the econometric results have been cast in doubt, particularly by Hansen and Tarp (2001), who found a non-conditional positive impact of aid on growth.[7] Comparing the econometric robustness of several aid- growth regression studies, Roodman (2007a, 2007b) ranked Burnside and Dollar rather lowly. In general, studies considering all developing countries, including those in which the amounts of aid received are negligible, may provide bias estimates, especially when the effect of aid is supposed to be conditional to another variable.

Still using a cross-sectional approach to the aid-growth relationship several authors have examined other factors likely to improve aid effectiveness. The country heterogeneity has still been mainly[8] addressed by adding a multiplicative variable so that the aid variable, in the model, is multiplied by a variable on which its effectiveness is supposed to depend. The Burnside and Dollar model may be seen as a special case. For instance Guillaumont and Chauvet (2001) argue that a major factor conditioning aid effectiveness in recipient countries is the economic vulnerability they face. We examine this view later in more details. In another paper, looking for a variety of factors likely to influence marginal aid effectiveness, Chauvet and Guillaumont (2004) have found the following: aid effectiveness simultaneously depends positively on the quality of present policy, negatively on the previous level of policy (support for catching up), positively on economic vulnerability (insurance effect, see below), negatively on political instability (as also found by Islam, 2005), positively on an index said of absorptive capacity combining infrastructure and education[9]. However, Gomanee et al. (2003) found the level of education as a factor of lower aid effectiveness (higher marginal productivity of the transfer of knowledge associated with aid). Still other factors conditioning aid effectiveness have been suggested in the literature such as geographical location (distance from the Equator in Dalgaard et al. 2004)[10], are not necessarily enlightening[11]. Actually, as noted above, when the effect of aid is conditional on another variable, the results may be highly sensitive to the extent of the country sample: it is the case if the countries receiving nearly no aid or an exceptionally high level of aid are also on the queue of the distribution for the conditional variable.

[7] See also Morrissey (2001) and Lensink and White (2001). Guillaumont et Chauvet (2001) working with longer periods (twelve years) could not find a significant coefficient for the interactive variable between aid and policy.

[8] It has also been addressed by breaking down the sample into more homogeneous components, particularly to focus on low income countries or on Sub Sahara: only few papers have done it (see for instance Ram 2004, still considering how aid effectiveness depends on policy, for a focus on low income countries, who find more significant results for the sub-sample of low income countries, or Gomanee et al., 2005b, for an analysis related only to Sub-Saharan Africa, who argue that the impact of aid on growth is channelled through investment).

[9] Finally (see section4), Guillaumont and Wagner (2012) show that aid positively influences the probability of an occurrence of a growth acceleration and that this effect is larger in vulnerable countries

[10] A relationship shown by Roodman (2007a) to be dependent on outliers (Jordan), and also criticized by Rajan and Subramanian (2005).

[11] Other variables are considered in the literature as possibly conditioning aid effectiveness, such as social capital Baliamoune-Lutz (2006), or the role of elites (Angeles and Neanidis, 2009).

The varying returns issue

Another approach to the heterogeneity of aid impact (and another source of non-linearity) has been to consider that aid effectiveness depends on the level of aid itself or of its own characteristics. This issue has been mainly addressed with regard to possible decreasing marginal returns to aid, evidenced by the positive coefficient of the aid variable combined with the negative coefficient of its squared value. Several studies had found such results (beginning by Burnside and Dollar 2000, Collier and Dollar, 2001, 2002, Hansen and Tarp 2000, 2001, Lensink and White 2000), with a corresponding threshold where the marginal contribution of aid to growth becomes nil, which reflects limited absorptive capacity for aid (see Feeny and de Silva, 2013, for a recent contribution). Besides, an upper threshold due to absorptive capacity, there may be also a minimum level of aid needed for effectiveness, justifying the need for a "big push" (Gomanee et al 2003, Guillaumont and Guillaumont Jeanneney 2010).

The identification of the thresholds may itself be dependent on country specific characteristics, which involves treating heterogeneity by combining two nonlinearities, the one due to the countries own characteristics and the other one due to the increasing or decreasing returns of aid. This combination has remained rare. And those studies that have used both hypotheses did it independently of each other. Hence the countries characteristics did influence the level of the average and marginal returns, but not their change with the level of aid, and consequently not the thresholds of change in the sign of the marginal returns (Burnside and Dollar 2000, Collier and Dollar, 2001, 2002).

The two kinds of heterogeneity (and non-linearities) resulting from countries specific features and from returns changing with the level of aid have been simultaneously captured in a new research using semi-parametric estimation technics (Wagner, 2013, and forthcoming). It evidences the coexistence of two opposite thresholds, a low level one (corresponding to the poverty trap and big push hypotheses), a higher one (corresponding to the absorptive capacity hypothesis), and at the same time suggests that the level of these thresholds depends on the structural economic vulnerability of recipient countries, as measured by an appropriate index (the Economic Vulnerability Index, EVI, of the United Nations).

The issue of time horizon: capturing the dynamics of aid

Two separate issues have been recently addressed in the literature, leading to explore the dynamics of the aid-growth relationship.

One is related to the time lag of the aid impact, lags depending on the channel through which aid operates. Clemens et al. (2012) address the issue of the timing of the impact of aid on growth and show that once this timing is correctly specified aid has a positive and significant impact on growth. They shows that allowing aid to affect growth with a time lag, first-differencing the data and considering only those portions of aid that might produce growth within a few years (budget support and project aid given for infrastructure investments or to directly support production).

help to find more robust results. According to their estimates, a one percentage-point increase in aid over GDP is typically being followed within few years by modest increases in investment and growth: a 0.3–0.5 percentage-point increase in investment/GDP and a 0.1–0.2 percentage-point increase in growth of real GDP per capita.

The other dynamic approach is raised in an historical perspective, where aid is intended to be transitory, so that the aid-growth relationship is expected to disappear once countries reach a self-sustained growth. Guillaumont and Wagner (2012) in line with Dovern & Nunnenkamp (2007), show that aid has an impact both on the probability of occurrence of growth acceleration spells and the durations of these spells. This double impact is higher in countries that are structurally vulnerable, as indicated by the level of their Economic Vulnerability Index (EVI).

Still a room for aid-growth estimates

The diversity of recent and innovative studies shows it is still possible to provide compelling evidence on the nature of the aid-growth relationship.

Indeed the results of over 40 years of cross-sectional research did not bring any form of real consensus to the debate, leading many researchers to discard the study of aid effectiveness at the macro level and to focus on impact evaluation at the micro level. Randomized Controlled Trials (RCT) soon became the gold standard of economic analysis, immune to the critics of macro-econometrics (see Banerjee et al., 2007). The number of RCTs has grown rapidly in an attempt to provide a clear catalogue of what works and what does not in development policies. However, RCTs also face a large amount of scepticism, summarized in Deaton (2010). First, by lacking of theoretical background, instrumentations strategies of most RCT do not bring more robust lessons than classical econometrics. Second, by their narrow scopes, RCTs do not bring enough information to assist policy makers in their decision for large scale policies: what works in some place and at some point main not produce the same outcome in another context; what works on a given and limited scale may not produce the same effect on a larger scale.

It does not mean that it is hopeless to pursue the search for a scientific measure of the aid effectiveness, at both the micro and macro levels. Rather than to abandon the analysis of aid impact on growth, the specificity of the results of micro impact studies invites to look at the country features making aid more or less effective.

1.2. From growth to poverty reduction: aid and the income elasticity of poverty

If foreign aid has a positive impact on growth and if growth reduces poverty, aid contributes to poverty reduction. For a given impact of aid on the growth rate, its impact on poverty depends on the income elasticity of poverty. Let us refer to the headcount index of poverty (number of people under the poverty line as a percent of the population)[12], the most usual definition of poverty. Some studies consider elasticity as given and identical for all developing countries, while in other studies

[12] See Rati Ram (2011) for an extensive review of available data.

specific elasticities are found or supposed for each country, depending on its domestic characteristics. Full assessment of the growth-poverty channel implies to considering how aid can influence the income elasticity of poverty.

When elasticity is supposed to be uniform

To be consistent with the works referred to, we provisionally consider the impact of aid on poverty reduction only through economic growth[13]: in their influential model Collier and Dollar (2001, 2002) suppose that aid reduces poverty only by its impact on growth and according to a given and uniform income elasticity of poverty. Collier and Dollar thus sought to determine the optimal inter-country allocation of aid that would reduce greatest the number of the poor in the world. The optimal allocation among countries then depends on the quality of their respective policies (conditioning growth effectiveness of aid, with decreasing marginal returns, as discussed above), on the income elasticity of poverty (assumed to be identical among countries and equal to 2), and on the initial number of poor in each country. The optimal allocation, resulting in a minimum headcount index of poverty at the world level, is obtained by allocating more to countries with good policies and a high number of poor (due to the initial headcount index, and to population size as well). Since it would lead to allocating too much to India, a cap was put on allocations to India.

Using another approach, the Millennium Project and other authors sought to determine the amount of aid needed to reduce the index of monetary poverty (headcount index) by half in each country (from 1995 to 2015). It can be implemented with various aid-growth relationships and an income elasticity of poverty either unique or varying by country. For a given elasticity and an aid-growth model à la Collier and Dollar, the aid allocation needed to meet the MDG1 in a country is then higher the worse the quality of its policy (Anderson and Waddington 2007). Thus, according to the two approaches the quality of policy influences "optimal" aid allocation in opposite directions.[14] The same paradox may appear with any other country feature conditioning aid effectiveness. However as for structural economic vulnerability the opposition is dampened since it both increases aid effectiveness and what is needed to meet MDG1. An appropriate solution, overcoming the previous paradox would be to equalize the chances of the each country citizens to move out poverty.

Domestic factors influencing elasticity

In their study on how much is required to achieve MDG 1, the reduction by half of poverty at the country level, Anderson and Waddington (2007) refer to elasticity measures for each country, as drawn from a paper by Datt (1998). Any estimate of the impact of aid on poverty through the

[13] This contrasts with the recent work of Alvi and Senbeta (2011) who examine directly the effect of foreign aid on poverty. This paper assesses whether aid directly impacts poverty after controlling for income, income distribution and other covariates that are relevant to the determination of poverty. Their approach represents a way of looking at the effects of aid on poverty without the aid–growth relation. Such an investigation is useful because even if aid fails to generate overall income growth, it is plausible that poverty mitigation still occurs.

[14] This opposition can be solved in an appropriate model of optimal allocation (Guillaumont 2008)

growth channel should also rely on hypotheses related to the factors determining the income elasticity of poverty. In a recent paper Rati Ram (2011) argues that the level of this elasticity is lower than usually supposed.

Indeed we can expect the income elasticity of poverty varying according to the income distribution of each country, and income per capita in each country.[15] As shown by Bourguignon (2003), the absolute value of this (negative) elasticity (sometimes called the growth elasticity of poverty) mechanically depends on the level of initial income per capita (+), on the initial level of unequality (-), and on the change in this level (-).[16] As a result of the first two factors, the income elasticity of poverty (any index) can be expected to be lower (in absolute value) when the initial level of poverty is higher. The impact of this initial level on changes in poverty, with various specifications, is confirmed by econometric tests (Adam 2004, Guillaumont and Korachais 2008).

This has important implications for the contribution of aid to poverty reduction through the growth channel. It means that if the aid-growth relationship does not vary with the initial level of income (and poverty) this contribution is likely to be smaller when the extent of poverty is large. It leads to less aid in very poor countries following to the Collier-Dollar model, and to more aid with the Millennium Project model. However it does not necessarily hold when the elasticity refers to the poverty gap instead of the headcount index.

Other factors of the income elasticity of poverty have been considered in the cross-country literature. Loayza and Raddatz (2010) find evidence that not only the size of economic growth but also its composition matters for poverty alleviation, with the largest contributions from unskilled labor-intensive sectors (agriculture, construction, and manufacturing). According to Wieser (2011) the growth elasticity of poverty reduction seems to vary with human capital, commercial openness, government expenditure and institutional quality. Of course all these factors may be influenced by aid.

Impact of aid on the elasticity through a change in income distribution

Another factor in elasticity, as underscored by Bourguignon (2003) and confirmed by the previously quoted econometric estimations, should also get attention, namely the change in income distribution. If aid has an impact on this change, it could influence the elasticity this way.

Very few studies have tried to directly test hypotheses on the effect of aid on the income elasticity of poverty (see Verschoor and Kalwij (2006) who consider both the effect of aid and that of the budget share of social services on the elasticity, without obtaining significant results for either[17]). They find that the aid volume increases the share of social services in the budget, an issue to which

[15] Moreover it is non linear: suppose everybody lives well below the poverty line, the elasticity of the headcount index will be zero, but it will be the same with everybody well above the poverty line, a case which can be ignored here.
[16] See also Heltberg (2004)
[17] They also consider the impact of aid and share of social services on the income elasticity of child mortality, which these ones appear significant.

we come back later. We will see also later that that the income elasticity of poverty may depend on the growth volatility (Guillaumont and Korachais 2008) and that aid may lower this volatility.

The studies on the effect of aid on the income elasticity of poverty may reflect a more general effect of aid on the change in income distribution, which in turn influences the poverty level directly and/or through the income elasticity of poverty. However cross-sectional researches considering how aid influences the income distribution are rather few and their results offer weak evidence (Calderon et al. 2006, Chauvet and Mesple-Somps, 2006).

The impact of aid on poverty through the growth-poverty channel has led to focus on poverty measured by the traditional indices of monetary poverty. Broadening the concept of poverty may lead to different and possibly more positive conclusions. For instance Morrissey (2001) argues that probably no more than a third of aid is directed at uses that would be expected to have an observable medium-term impact on growth, while other forms of aid can have an impact on welfare. For Gomanee et al. (2005a) aid used to deliver health and education services, can only influence growth in the long term, but can influence aggregate welfare immediately. Thus, considering only the growth channel would underestimate the impact of aid on aggregate welfare and poverty, as confirm by the results of Alvi and Senbeta (2011). In short, there is an impact of aid on the income elasticity of poverty, although its magnitude is uncertain because of the heterogeneity of countries situations and the multidimensional nature of poverty.

2. The public expenditure channel

A major issue for public opinion is what effects aid can have on poverty through its impact on public finance. By softening the budget constraint aid may induce a higher level of expenditures in the social sectors, such as health and education, those which are most likely to benefit the poor. Moreover, if targeted on the social sectors, aid can directly lead to an increase of these expenditures. By financing these expenditures, aid is expected to enhance human development, measured by indicators such as child survival or adult literacy. We briefly review how these various relationships have been tested in cross sectional studies.

Of course, health and education public expenditures, on which the interest of the international community has been focused, do not always mainly benefit the poorest, while some other public expenditures may have an important effect on their economic situation, for instance feeder roads in poor areas and even security expenditures in various cases. But the impact of the overall structure of public expenditures on the poor is better assessed on a case by case basis. Relying on cross-sectional findings, we follow the conventional approach of considering health and education public expenditures as those most important for the poor.

Following the same approach as in the previous section, we consider the impact of aid on public social expenditures and the impact of these expenditures on corresponding social outcomes, with special attention to how aid can influence this second phase. To be reminded, aid can influence

social outcomes without being channelled through public expenditure when it is directly allocated to private actors such the NGOs.

2.1. From aid to social public expenditures

We firstly consider the impact of the total amount of aid on public social expenditures, secondly the effects of aid specifically targeted on such expenditures. A caveat is needed. The difficulties of cross country aid growth regressions (in particular heterogeneity and endogeneity) are all still present, and often they are difficult to address. In particular the heterogeneity of state behaviour is likely to be high.

The impact of the total amount of aid on public social expenditures

The level of public social expenditures depends on the total amount of public revenue and on the preference given by the recipient country to this kind of expenditure compared to others.

The risk of crowding out fiscal revenue. The total amount of public revenues and expenditure depends on the level of national income and its growth. It may be influenced by aid, as examined in the previous section, but considered here income as given. It also directly depends on the level of aid. The degree to which additional aid is transformed into additional public revenue has been debated. Numerous works have examined to what extent aid increases total public revenue, considering possible crowding-out of domestic sources of revenue. In the recent literature on the impact of aid on public revenue, as pointed out by Morrissey et al. (2006) and Morrissey (2012), there was "no consistent and robust relationship between aid, the composition of aid, and the tax to GDP ratio in developing countries". However Brun et al. (2008), using broader data to measure public revenue and treating aid endogeneity more adequately[18], observe a positive impact of aid (loans or grants) on tax effort, instead of crowding out tax revenue. This result is explained by the fact that aid can improve the effectiveness of public administrations in order to compensate for the negative effect due to additional funding. More recently, Clist and Morrissey (2011) distinguish the specific effects of loans and grants on taxation using panel data find no robust evidence that grants have a negative effect on tax revenue, but identify a positive effect of loans. Finally, Prichard, Brun and Morrissey (2012) argue that understanding the impact of aid on taxation ideally requires information about the whole budget process, including spending, as these studies commonly find that among budget components the tax to GDP ratio varies the least (in technical terms it is exogenous, or not determined by the other variables in the fiscal system; in other words, other budget components make most of the adjustments required to balance spending and revenue).

The main lesson for this literature is that even when aid weakens the fiscal effort, it only partially substitutes for domestic sources of public revenues: the net effect on total public revenue is likely to be positive (as appeared to be the net effect of foreign capital inflows on investment in the earlier literature on the possibility they were crowding out savings, Guillaumont 1985). In other

[18] Their approach complements the one proposed by Tavares (2003) by including two additional instruments reflecting the situation of public finances of donor countries.

words, even if not one for one, an aid increase generally results in a rise in public revenue and expenditure. A positive impact of aid on public revenue is found in most of the panel works recently done (Ghura, 1998; Ouattara, 2006; Morrissey et al. 2006)[19], as well as in several country studies using time series analyses (Osei et al. 2005; Mavrotas and Ouattara 2006) (for a survey of the literature, see Brun et al. 2008).

Need for a dynamic perspective. The issue should also be addressed in a dynamic framework. The level of the tax- GDP ratio is likely to increase when aid enhances growth, since the marginal ratio is generally higher than the average. This effect is most often kept aside since the level of income per capita is generally controlled for in earlier studies. Moreover the impact of aid on growth can itself be reinforced by the stronger incentives induced by lowering the pressure on tax payers, particularly small enterprises, and the risk of discriminatory treatment, so visible when the state is short of resources (Gunning 2004, Guillaumont and Guillaumont Jeanneney 2010).

More broadly, Prichard, Brun and Morrissey (2012) propose a context-specific approach, moving away from asking, 'does aid contribute to lower tax collection in developing countries?', and towards asking, 'how do aid flows and associated policy conditions shape tax collection incentives, and under what conditions might this effect be positive or negative?'

The public marginal propensity to spend in social and in other sectors. Let us now examine the marginal propensity to dedicate aid receipts to social or pro-poor expenditures ignoring the possible substitution of aid to domestic public revenue. If aid increases the amount of expenditure dedicated to sectors such as education, health, water access and sanitation, it can enhance social outcomes. Many econometric studies investigate the relationship between the volume of aid and social public expenditures, with very different results. Actually they study either the impact of aid on the absolute level or relative share of expenditures, which does not at all have the same meaning. Aid can contribute to increasing the level of these expenditures (positive marginal propensity to spend in social sectors), but not to increasing their share in all public expenditure (if the aid elasticity of social expenditures is lower than the aid elasticity of all public expenditures). Then there is no surprise to find more significant positive results when the level rather than the share of social expenditure is considered.

The impact at this *level* is well established in a paper by Mosley et al. (2004): they estimate a system of equations using data for some 46 countries in the 1990s and find that aid is associated with higher levels of pro-poor spending. Similar lessons may be drawn from Audibert et al. (2003): observing important differences in health public spending between developing countries, they examine the impact of financial constraints (debt servicing and overall budget constraints) on public health spending. They found that these external financial constraints have a negative effect on public health spending and that net transfers and grants have positive impact.

[19] An exception is Gupta et al. (2003) whose results are criticized by Morrissey et al (2006) (see Brun et al. 2008)

Three studies suggest that the impact of aid on the *share* of social or pro poor expenditures can also be positive. Gomanee et al. (2005a) argue that total aid influences public spending allocations among the different sectors in favour of the social sectors. Gomanee et al. (2005b) in another paper find that aid tends to increase pro-poor expenditure for low-income countries: they also found that pro-poor expenditure tends to be higher in countries receiving more aid, ceteris paribus. Both papers use the lagged aid variable to deal with the endogeneity of aid problem. Then, Verschoor and Kalwij (2006) testing the factors affecting the share a government allocates to expenditures on social services, found that total aid increases this share and aid thus promotes pro-poor growth (1 per cent point increase in total aid leads to a 0.25 per cent point increase in their share). However, the problem of aid endogeneity is not addressed in this study.

Some other econometric studies present results suggesting the absence of impact of aid on social expenditures. For instance, Masud and Yontcheva (2005) test the impact of different kinds of aid on public spending between 1990 and 2001, suggesting a substitution effect between bilateral aid and public social expenditures.

Effects of aid targeted on social expenditures

Of course when a large part of aid is targeted to social expenditures, aid is expected to have a positive impact on these expenditures. However aid is often considered as fungible within the budget of the recipient country. There is fungibility when aid targeted to a particular purpose which would have been financed anyway is freeing resources for another purpose that would have not been financed otherwise[20]. The debate on fungibility is an old one[21]. It has been revived after the publication of the book *Assessing Aid* (World Bank, 1998) where the risk of fungibility was presented as an argument against project aid. How far fungibility lessens aid effectiveness for poverty reduction is not clear for several reasons linked both to the difficulty to assess the extent of the fungibility and to uncertainties about its impact on poverty reduction.

Assessing the extent of fungibility. Any test of fungibility involves in looking at the (partial) correlation between targeted aid and corresponding public expenditure: to what extent does an increase in targeting to health or education result, ceteris paribus, in increased health or education public expenditures? Actually there is no convincing evidence of the extent of fungibility, particularly in the social sectors.

Two studies, using cross-country panel data and used for supporting the view presented in *Assessing Aid*, are often quoted. One is Feyzioglu et al. (1998) who found that aid is fungible in agriculture, education and energy, but not in the transport and communication sectors where aid leads to a one-for-one increase in public spending. The Word Bank's own study (by Devarajan et al., 1999), focused on African countries (where fungibility was suspected to be the cause of aid ineffectiveness) concluded that aid is partially fungible. However, these two studies have been

[20] Fungibility is said to occur when the marginal increase in sectoral expenditure following the receipt of aid is lower than the marginal amount of foreign aid dedicated to this particular sector.
[21] See Guillaumont (1985) for an historical perspective and an analysis of the main factors affecting fungibility.

criticized because the sectoral aid data used only include concessional loans (due to availability), while grants represented two thirds of sectoral aid (Berg, 2003; Lensink and White, 2000).

New panel studies from the IMF still give an ambiguous picture. Masud and Yontcheva (2005) found bilateral aid to be fungible (58 counties considered from 1990 to 2001), but, more interesting for our purpose, Mishra and Newhouse (2007) focusing on health aid (118 countries from 1973 to 2004), concluded that aid targeted at health does not appear fungible. This result is supported by a recent study by Van de Sijpe (2013) who shows that fungibility is limited in education and health sectors.[22] Finally, while it remains difficult to econometrically test the fungibility of sectoral aid, there is little evidence of fungibility of aid targeted at social sectors.

Fungible may not mean less effective. Even when fungible according to the meaning given in the previous studies, aid targeted at social sectors may be effective in improving these sectors. The relevance of fungibility for our purpose may then be overestimated.

First, even when aid targeted at specific social expenditures appears fungible, it does not necessarily mean that its use is less pro poor. It is conceivable that the government takes the opportunity from assistance targeted to social expenditures for the international fashions of the day to finance other sectors more "pro-poor" in the country context (for instance agriculture). The result depends on the government use of freed resources.

Second, it could be that a part of sectoral aid may not be channelled through the budget and is then not likely to increase social (budget) public expenditure correspondingly. If in this case there is fungibility in budget expenditures, targeted aid should not result in improved sectoral outcomes but in the converse case, it should. Thus, the existence of a link between targeted aid and corresponding sectoral outcomes suggests the absence of full fungibility (direct and indirect). A striking result of some cross-sectional studies is that public aid targeted at social sectors such as health or education more easily produces this aid impact on the sectors themselves than on the corresponding public expenditures. For instance, investigating the impact of aid on school enrolment, Dreher et al. (2008) find that aid allocated to education does not lead to an increase of public expenditures for education (fungibility), but has a positive impact on enrolment.[23]

The relevance of fungibility may also be challenged for a third reason. Even if fungible in terms of sectoral allocation, aid targeted at social or pro-poor expenditures may have a technical content making its implementation different from that of domestically financed expenditures in the same sector. Beyond the transfer of money, targeted aid may thus bring ideas and know-how. Conditionality and technical assistance may be used to reinforce this effect. Pettersson (2007)

[22] Besides these panel studies, some older country studies using time-series data also produced ambiguous results (Pack and Pack found fungibility in Indonesia (1990), but not in the Dominican Republic (1993)., while Mavrotas and Ouattara (2006) found no evidence of fungibility (in Philippines, Costa Rica and Pakistan).

[23] Another example, different but leading to a similar conclusion, is given by a paper of Mishra and Newhouse (2007): finding the impact of total aid on health outcomes is relatively low and not significant whereas the impact of health aid is significant, they conclude that health aid does not seem to be fungible.

found sectoral aid fungible in a sample of 57 aid-recipient countries but did not find any evidence of non-fungible sectoral aid working better than fungible sectoral aid.

In conclusion, what matters is whether fungibility results in lower aid effectiveness in the target sectors. The existing literature does not allow any definitive conclusion on this matter.

2.2. From social expenditures to social outcomes: the role of aid

Aid effectiveness for poverty reduction through the public expenditure channel involves not only an aid impact on public expenditures, but also an impact of public expenditures on poverty. The latter is paradoxically debated in the cross section literature. But the debate can be enlightened by considering the role of aid in this relationship.

The social expenditure-outcomes puzzle: a failure of cross sectional studies?

Despite a large macro-economic literature, the impact of public expenditures on social outcomes is debated, for health even more than for education. As for health, no relationship was found by several studies summarized by Musgrove (1996), as well as by Filmer and Pritchett (1999) and Wagstaff and Claeson (2004), while Bokhari et al (2007) found a positive link. As for education, weak or insignificant link is also reported by some studies (Roberts 2003, Dreher et al. 2008), with the exception of d'Aiglepierre and Wagner (2013) who show that aid to primary education has a significant and non-negligible impact on access to primary education. Why increased public expenditures on health or education could not result in an improvement of the main health or education indicators?

First, public expenditures may be biased in favour of the rich. For example, Morrisson (2002) argue that, in Madagascar and Tanzania, education and health services did not primarily benefit the poor. In addition, services for the poor were mostly of lower quality. Castro-Leal et al. (1999) showed that increasing social expenditures in Africa did not benefit the poor and did not guarantee welfare improved welfare because of unequal distribution of benefits. Berthelemy (2006) argued that public education public expenditures are not necessarily pro- poor as they are mainly for secondary and tertiary education and are biased against primary education in most African economies, leading to an unequal distribution of human capital. Similar findings for health expenditures are evidenced by Berthelemy and Seban (2009). However some other authors have identified cases in which public social expenditures have been pro- poor. For instance, Lanjouw and Ravallion (1999) underline (on the case of India) that the benefits of public expenditures are becoming more pro-poor when social programs expand, early benefits being captured by non-poor. One can also wonder which type of expenditure benefit the most to the poor. For instance, expenditures dedicated to agriculture are generally pro-poor, as found by Mosley and Suleiman (2007).

Second there may be leakages between the initial public disbursements and the final delivery of the corresponding social service (Reinikka and Svensson 2001, Gauthier and Wane 2008).

Finally the weakness of the correlation between public social expenditures and social outcomes may result from the general problems discussed above about the aid–growth relationship (well emphasized by Deaton, 2009): here mainly the problem of endogeneity that necessitates the use of instrumental variables, and also the problem of heterogeneity, that needs to condition the effect to the level of another variable (i.e., the use of a multiplicative variable).

Are public social expenditures more effective when supported by aid?

Aid can benefit to the poor without necessarily having any impact on monetary or income poverty, since aid can finance expenditures that improve the welfare of the poor, such as universal access to primary education and health care.

We have noted above that according to cross-country studies aid targeted to social sectors has clearer effects on social outcomes (health and education) than on corresponding public social expenditures, either because they are not channelled through the budget or because, when they are, they may be both fungible and more productive. Consistently aid, in particular targeted aid, has clearer effects than public social expenditures on social outcomes. These paradoxes suggest that the public expenditure channel through which aid can contribute to poverty reduction should not be examined only for its impact on the size of public social expenditures, but also as a factor of enhancing productivity in social sectors. Let us take as an example supporting this hypothesis a paper by Gomanee et al. (2005b): they tested the direct effect of aid on welfare or poverty for a sample of 104 countries and found a positive direct impact on the quality of life, measured by HDI, and on child survival, but no impact of public social spending.

Aid to education. Cross sectional studies of the impact of aid on the educational sector are still limited. Some studies provide recent information on this issue. [24] Michaleowa and Weber (2007) have investigated the relationship between aid to the education sector and primary, secondary and tertiary school enrolments, using aid data from DAC. As for outcomes, they use primary completion rates and gross enrolment rates for secondary and tertiary levels. Estimations done either with GMM or with fixed effects show a rather small impact of aid on school performance at all levels. However, the results may be under-estimated because of disaggregated aid data problems. In a major study Dreher et al. (2008) found a limited but robust positive impact of aid targeted to education on primary school enrolment. In a panel of 105 countries for the period 1970-2005, they estimate the impact of aid for the education sector (measured as a percentage of GDP) on net primary school enrolment, with GMM system. To be noted, these results do not hold when considering aggregate aid as the explanatory variable, what is consistent with our hypothesis of the specific productivity of aid targeted to social sectors. Anyway these studies confirm the need to disaggregate aid to measure its effectiveness in terms of poverty reduction.

[24] Wolf (2007) also finds a positive impact of aid targeted to education on literacy, primary completion rate for a panel of developing countries in line with the two studies.

More recently d'Aiglepierre and Wagner (2013), using recent data over the period 1999-2009 and an instrumentation strategy close to that of Tavares (2003), show that aid to primary education has a strong and significant impact on enrolment, as well as on gender equity and repetition rates in primary school.

Aid to health. The impact of targeted aid on health outcomes has mainly been examined with reference to infant or child mortality. Let us refer to some recent studies, done after that of Gomanee (2005b) quoted above. Mishra and Newhouse (2007), found a statistically significant, but small effect for 118 countries between 1973 and 2004: doubling per capita health aid would be associated with a 2 percent reduction in the child mortality rate; nevertheless they used aid commitments data from the Country Reporting System (CRS) not disbursements, and with very limited coverage at the beginning of the period. Wolf (2007) also found a positive impact of aid targeted to health on infant mortality, and on child (under-five) mortality. Also using the CRS commitments database (from the 1980s), Chauvet et al. (2009) found a non-linear impact of health aid on child mortality, decreasing with income per capita: it means that aid allocated to the health sector should be more effective in the poorest countries.

Knowledge transfer: lessons from micro studies and impact analysis

If aid for the social sectors induces increased productivity in these sectors, the effect is likely to depend on knowledge transfer on the best practices. Macroeconomic analysis of aid effectiveness for poverty reduction cannot be disconnected from improvements in the microeconomic analysis of the effectiveness of specific public projects, programmes or expenditures.

As seen above, the micro level evidence on social impacts of health or education operations is growing: impact analysis has improved knowledge about what seems to work. Even if it has been financed by aid, it is not necessarily due to aid financing, compared to what can be financed from another source (mainly domestic budget).

A major area of impact analysis has been *education*. There has been significant progress made in increasing enrolment (the second Millennium Development Goal), although they have been limited both by cost increases and high dropout rates. Impact analyses have helped to evaluate the usefulness of various programmes focused on reducing costs and/or drop out rates[24]. In particular they have shown the effectiveness of conditional cash transfers (CCT thereafter) programs, consisting in giving money to the parents conditional on child school attendance, as children are often used to cope risk when households are exposed to shocks (de Janvry et al., 2006). PROGRESA, a famous programme implemented in Mexico has been shown to have positively affected school enrolment (Schultz, 2004).

Impact analyses have also shown the effectiveness of other interventions to increase school attendance.[25]

As primary school enrolment is growing quickly, another challenge is to make children learn effectively. Low achievement is not only linked to high drop-out rates. Numerous tools can be used to enhance schooling quality such as teacher preparation and reducing teacher absenteeism with financial incentives. In order to know which tools are more effective in improving school quality, impact studies are both still needed and difficult, because long and costly, since the trial experiment should be conducted until the completion of schooling.

Impact analyses for health (as well as many studies conducted in this field before the extension randomized experiments[26]) are also useful, bringing rich information for health policy, in particular for preventive policy, such as immunization. Recent impact studies (with trial experiment) have noticeably shown the high level of price elasticity of demand for preventive goods and services, then the usefulness of a system of incentives (for instance for the price of deworming drugs in Kenya (Kremer et al.,2004), or insecticide treated bednets in Kenya (Cohen and Dupas, 2008), for picking up results of HIV tests in Malawi (Thornton, 2008), or for immunization in India (Banerjee et al.,2008).

The impact of budget support conditionality

A large share of ODA is delivered as budget support. Commitments, and especially disbursements of this kind of aid, as with balance of payment support, are generally linked to "conditions" the recipient country should meet. The traditional type of conditionality involves specific economic policies the country should follow and includes specific policy measures. In the last two decades such a conditionality has been repeatedly criticized as ineffective, arbitrary, inconsistent with alignment and ownership principles, agreed upon in particular in the Paris Declaration, the Accra Agenda for Action, and the Busan Declaration. Partly relying on cross country analysis, proposals had emerged from the mid-nineties to replace the policy traditional conditionality based on policy instruments by an outcome or results based conditionality (see Collier et al. 1997, Guillaumont and Guillaumont Jeanneney 1995, 2006, Kanbur 2005). Indeed, it is through cross-sectional analyses that one can best attempt to measure "performance", often proposed to be the basis for conditionality, as well as, as we shall see, for the allocation of aid between countries: performance can thus be measured as the share of results (in terms of growth, poverty reduction, ...) that cannot be explained by structural or factors beyond the political will of countries (Guillaumont 1995 Guillaumont and Chauvet 2001).

[25] Another program that has encouraged school attendance for girls is merit scholarships for girls in Kenya. The random experiment processed by Kremer et al. (2004) show a positive effect on school enrolment, better results for these girls and also some externalities to boys' performance in the same classroom. Miguel et Kremer (2004) also show that absenteeism in Kenya was reduced by 25% following a mass treatment with deworming drugs, they also point out the huge externalities for children and school that did not receive the treatment. Such a randomized trial evidences that in this case deworming is the most cost-effective way to increase school enrollment.

[26] See Levine (2004) review of successes of aid interventions in terms of health improvements.

We remember that a corollary of the Burnside-Dollar model was that (the amount of) aid was without effect on policy, implying scepticism about the effectiveness of traditional conditionality. A logical consequence has been to move to an aid allocation relying on an assessment of policy (through the CPIA) with the view of increasing aid effectiveness. But as far as the empirical basis for the model (effectiveness dependent on policy) appeared weak, the message became to use a policy based allocation as an incentive for the adoption of good policies…Thus the message has become closer to the traditional view of the policy based conditionality. And the distinction between policy based conditionality (for budget support) and policy based allocation (for total aid) may seem blurred when criteria for aid allocation meet conditions to budget support, what can be the case of policy measures focused to the poor. However the policy criteria of aid allocation are generally broader than the policy conditions of budget support.[27]

When intended to favour the poor, conditionality had to put pressure on recipient countries to increase their social expenditures or take other appropriate measures in these sectors. However, the usual criticism is still valid: national ownership is weakened and effectiveness uncertain (in particular social expenditures can be increased, without clear social results).

The European Commission has partially reformed its conditionality by determining a part of the global support according to results or outcome indicators, instead of policy measures. This approach is intended to encourage national "ownership" of political reforms, but also to improve transparency and coordination among donors. However, it often remains based on indicators intermediate between policy measures and outcome indicators, such as the number of schools built or public health facility attendance, rather than indicators of final impact on poverty, such as the reduction of child mortality or the improvement in the real literacy or learning attainment (Adam et al. 2004). A genuine performance-based conditionality would be the more effective to reduce poverty. It should rely on improvements in poverty focused MDG indicators, so that it can improve both national ownership and the impact of aid on poverty reduction. It would also need to take the exogeneous shocks faced by the countries into consideration (Adam et al. 2004).

3. The stabilization channel: aid as a factor dampening vulnerability

At the macroeconomic level, a major effect that can be expected from aid is its stabilizing impact. The reason is simple. Exogeneous sources of instability, either external or natural, and the growth volatility they induce are significant factors lowering average growth. They also contribute to higher inequality, making growth less favourable to the poor. If aid does stabilize income growth, it is likely to enhance growth and to make it more pro-poor. To review this rather neglected, but essential macroeconomic effect of aid on poverty, we first recall how to assess the stabilizing impact of aid, then precise how it influences the working of the previous channels examined, in particular how it conditions the effects of aid on growth, and how, by influencing the distribution

[27] There is mitigated evidence that aid targeted to social sectors is more effective when macroeconomic policy and institutions are "good": Mishra and Newhouse (2007) find that health aid has been more effective in reducing infant mortality in countries with better policies and institutions; for aid to education Dreher et al. (2008) (as Gomanee et al., 2005) find no relationship with the quality of institutions.

of income, it conditions the impact of growth on the reduction of poverty. By these two ways the stabilizing impact of aid constitutes a major channel from aid to poverty reduction. It also could influence the public expenditure pattern, reinforcing this other channel, due to the negative impact of macroeconomic volatility on public finance, an effect not examined here due to lack of space.

3.1. How to assess the stabilizing impact of aid

There has been a recent growing concern about aid instability and unpredictability. Aid has even been criticized for "pro-cyclicity" with regard to public revenue, what may not be very meaningful due to the endogeneity of this revenue. And, even if there is some ground to the concern about unpredictability, it does not involve that aid has a destabilizing macroeconomic impact. Empirical evidence rather suggests the opposite.

There are two main ways by which the stabilizing or destabilizing impact of aid can be assessed (Guillaumont Jeanneney and Tapsoba (2012), Collier and Goderis (2009), Chauvet and Guillaumont, 2008, Guillaumont 2006).

The first one, relying on data at the country level, is to compare the evolution of aid to that of the exogeneous flow the most likely to be a source of instability in low income countries, the export of goods and services. To see whether aid is stabilizing with regard to exports, an index is given by the difference between the index for volatility of exports and the index for the volatility of the aggregate flow "aid plus exports": this index shows to what extent the instability of exports is dampened by aid inflows. Aid is generally stabilizing when it is countercyclical, but also in some cases when it is pro-cyclical, if its cycle is dampened compared to that of exports.

The second and more general method, relying on cross country data and taking into account all the sources of exogeneous shocks is to estimate a model of the instability of national income (or of growth volatility) including the aid to GDP ratio as an explanatory variable. The coefficient of this variable is found to be significant and negative (Chauvet and Guillaumont 2009).

The stabilizing impact of aid, tested according to the two methods, has been confirmed and compared with those of remittances by Guillaumont and Le Goff (2010) over 1980-2005, the two kinds of flow being found stabilizing, more significantly for remittances with the country by country method, but rather more clearly for aid with the cross-country method.

3.2. The more aid is stabilizing, the more it is growth enhancing

In the discussion of factors conditioning aid effectiveness for growth, several papers suggest that aid may be more effective in countries exposed to strong and/or recurrent exogenous shocks. This argument can be briefly presented in two steps.

Structural vulnerability is harmful for growth.

It is well established that macroeconomic instability has harmful consequences for development (see a review in Guilaumont 2006, 2009). Indeed, numerous works have shown the negative effect on the average growth of income either of income growth instability (Ramey and Ramey, 1995; Hnatkovska and Loayza, 2005; Norrbin and Yigit, 2005), or of specific exogeneous instabilities, more particularly export instability, especially in Africa (Guillaumont et al. 1999). The negative effects of instability on growth come both from uncertainty and risk-aversion (ex ante effect) and from asymmetric responses to positive and negative shocks (ex post effect). As income growth is a major factor in poverty reduction income instability hurts the poor through its negative effect on income growth.

Exports instability of is not the only source of vulnerability in developing countries. Structural economic vulnerability is the vulnerability to exogenous shocks depending on structural factors, not on the present will of countries. It is one of the identification criteria of the Least Developed Countries (LDCs), as assessed by the Economic Vulnerability Index (EVI), which depends on both the frequency of recurrent external shocks (export instability) and natural shocks (reflected by the instability of agricultural production and the number of people affected by natural disasters) and exposure to shocks (captured by the smallness of the size of its population, its remoteness from international markets, the structure of its production or its exports). It is because structural economic vulnerability is an obstacle to growth, that it is used to identify LDCs (on all these points see Guillaumont 2009, 2013).

Aid effectiveness higher in vulnerable countries: aid enhances growth by dampening instability

If aid contributes to dampening the degree of income instability, it can be expected to contribute to faster growth. This hypothesis has been developed and tested by different ways in several papers (Guillaumont and Chauvet, 2001; Chauvet and Guillaumont, 2004, 2008; Guillaumont and Le Goff, 2010; Guillaumont and Wagner, 2012). As seen above, following the debate opened by Burnside and Dollar (2000), it is clear that aid effectiveness is conditional on specific features of the receiving countries (an interactive term between the aid variable and the feature of interest being expected to capture this conditional effect). Structural vulnerability seems here to be an essential factor of this conditional effectiveness.

The feature is structural vulnerability, measured in one way or another (Guillaumont 2009, 2013). Various measures of vulnerability have been used in the estimation of this conditional impact of aid on growth (composite indices, such as the Economic Vulnerability Index, or only instability of exports of goods and services), with different specifications, control variables, instrumentation, etc. In all cases, while the structural vulnerability variable has a negative effect on economic growth, it increases aid effectiveness (positive effect of the interactive variable aid x vulnerability): aid is more

effective in more vulnerable countries. In other words, aid dampens the negative effect of vulnerability on growth.

Other studies relying on cross-country regressions, but using different methodology come to similar conclusions. Collier and Goderis (2009), using an error correction model, evidence that aid mitigates the impact of negative commodity export price shocks on short-term growth and suggest that donors could increase aid effectiveness by redirecting aid toward countries with a high incidence of commodity price shocks. Guillaumont Jeanneney and Tapsoba (2012), applying the method of the decomposition of the cross-sectional variance of output growth introduced by

Asdrubali et al. (1996), show that ODA stabilizes resources available for the financing of consumption, investment and trade: "stabilizing aid" is effective in aid dependent and vulnerable countries.

Moreover, it seems that vulnerability (instability) enhances the absorptive capacity, as evidenced by a higher threshold of aid level to reach negative marginal returns when vulnerability is high (Wagner 2013): the result is robust, either with vulnerability measured by export instability or by the Economic Vulnerability Index. Additional support to this macroeconomic test has come from a "meso-analysis" of the factors determining the rate of success of World Bank projects. Vulnerable countries appear less exposed to decreasing returns from projects when the aid level increases (Guillaumont and Laajaj, 2006). It is another way of saying that aid enhances the absorptive capacity.

Finally, recall that in a dynamic perspective, when measuring the impact of aid on the probability of occurrence of a "growth spell", it appeared that this probability was higher in countries with high vulnerability (Guillaumont and Wagner, 2012). The basic idea is always the same: in a world subject to various and important shocks, vulnerable countries are at risk from seeing their growth compromised. In these countries more than in other, aid, by increasing their resilience to shocks, can maintain growth or prevent state bankruptcy and the chaos that may occur as a result of shocks.

3.3. The more aid is stabilizing, the more growth is pro-poor

Macroeconomic instability is harmful for poverty, through income distribution

It is also reasonable to suppose that, for a given level of income per capita, macroeconomic instability influences income distribution and then poverty. Instability may increase inequalities because of the asymmetry of responses to positive and negative shocks, depending on whether people are initially rich or poor: poor and near poor people are more vulnerable to instability than richer people. They have less diversified sources of income, are less skilled and less mobile between sectors and areas (Laursen and Mahajan, 2005)). Likewise, they have little access to credit and insurance markets and depend more on public transfers and social services (Guillaumont Jeanneney and Kpodar, 2005). The inability of poor people to face negative shocks results in losses

of human capital, which are difficult to reverse, e.g. nutritional status (Dercon and Krishnan, 2000, for Ethiopia), or removing children from school (Thomas et al., 2004, for Indonesia).

A few cross-country econometric analyses of the effects of instability on inequality have been performed. Laursen and Mahajan (2005) find a negative effect of income instability on the poorest quintile, while for Breen and Garcia-Penalosa (2005) the next to last quintile (rather than the last one) appears to be the most affected, suggesting that almost poor people may become durably poor under unstable conditions. More recently Calderon and Levy Yeyati (2009) have also evidenced distributive effects of output volatility, captured both through the Gini coefficient and the through a differentiated impact on each quintile, effects found non-linear, as depending on other variables such as the level of public expenditures, considered as a mitigating factor.

Thus income instability besides its effect on poverty reduction through an impact on income growth, also affects poverty reduction by increasing inequalities. Such an effect is examined by Guillaumont and Korachais on 1981-2005 (2008): when income instability increased by one percentage point over a six year period, then the poverty (headcount) level increased by about one percentage point on average. Similarly, Guillaumont, Korachais and Subervie (2009) find negative effects of macroeconomic instability (income volatility and primary instabilities, such as export instability) on child survival, once controlled for the effects on income level.

A potential contribution to pro-poor growth

If macroeconomic instability generates poverty and if aid has a stabilizing impact, it should be expected that due to this impact aid contributes to poverty reduction not only by increasing the rate of growth but also by making this growth more pro-poor. However, as seen above, very little macroeconomic research has been done on the effect of aid on poverty, and in particular through its stabilizing impact. Let us note a draft paper by Guillaumont and Le Goff (2011) where the negative impact of export volatility on child survival is found to be dampened by the (average) aid level, and the remittances level as well. It is obviously still an area for future cross-country research.

The potential effect of aid to reduce poverty thanks to its stabilizing impact is particularly important in the context of word financial and economic turmoil. The risk seems high for vulnerable low income countries, although they have not been particularly affected by the world recession (due to the level of commodity prices and migrant remittances). But they are probably more vulnerable to idiosyncratic shocks than to common shocks, such as that of the previous world recession. Many people within these countries, particularly the LDCs, are at the risk of becoming poorer or falling into poverty traps.

In that perspective the evolution of aid flows has a crucial role. If sustained, they will be an important stabilizing factor, all the more that it will be possible to implement compensatory finance schemes and that shocks are idiosyncratic. Aid will then easily work as an insurance. But if aid flows are also affected by the crisis, which tends to generate common shocks, they can cease to

be stabilizing and even contribute to the countries' difficulties. Anyway, present concerns are very far from those expressed a few years ago of the risk of Dutch disease induced by scaling up aid.[28]

4. Conclusion: main lessons of cross section analyses to make aid more "poverty reducing"

The main policy conclusions of the preceding review of the cross-country studies of the channels through which aid contributes to poverty reduction can be summarized in a few principles (see details in Guillaumont, 2008; Guillaumont and Guillaumont Jeanneney, 2006, 2010, Guillaumont et al. 2010).

1) "Bad money drives out good." Gresham's Law seems to apply to cross-sectional studies of the aid-growth-poverty relationship. Polemic and not so robust studies have eclipsed the results obtained from analyzes treating seriously the problems of endogeneity and heterogeneity. From these it follows that aid contributes to the launch of growth spells, to the level of the growth rate, and to the reduction of poverty, all the more that the countries are more vulnerable to external shocks. Aid is more efficient in poor vulnerable countries.
2) It results in a conclusion for aid allocation criteria, particularly in the case of multilateral development banks that use an allocation formula described as "performance based allocation" (PBA). Introducing a structural economic vulnerability criterion in the formula is not only a principle of justice (to offset the structural handicaps and to equalize opportunities), but also, with regard to the results of the analyses presented in this article, it would help to increase the effectiveness of aid to reduce poverty. The principle of a priority given to LDCs is henceforth justified.
3) Strengthening the stabilizing effect of aid, essential to increase its contribution to poverty reduction, can also be searched through various compensatory financing mechanisms, provided they can be mobilized quickly and efficiently, which probably involves some improvements to the current schemes.
4) The targeting of aid, insofar as it is assigned to expenditure to reduce poverty, must fulfill two conditions. One is to maintain a balance between allocations that promote growth and those that enhance social spending, since both contribute to the reduction of poverty. The second is to attach less importance to the risk of fungibility of aid and its ability through its allocation to transfer knowledge on the most effective and equitable means of providing public services and fighting against poverty.
5) Progress towards a conditionality truly based on results and performance can strengthen ownership of the people responsible in the countries for the policies implemented. It would thus make budgetary support more effective for a sustained poverty reduction. Indicators of poverty reduction and of improvements in health and education should be preferred to indicators of policy in the design of conditionality.

[28] Discussed in Guillaumont and Guillaumont Jeanneney (2010)

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